NOV. 5 Oct. 22 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20
THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER
FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.

The

Monthly Evening Sky Map

A SCIENTIFIC JOURNAL AND EDUCATIONAL GUIDE IN ASTRONOMY FOR THE AMATEUR
Founded in 1905 by Leon Barritt

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS - MORNING AND EVENING - AND PRACTICAL ANYWHERE IN THE WORLD
PUBLISHED QUARTERLY

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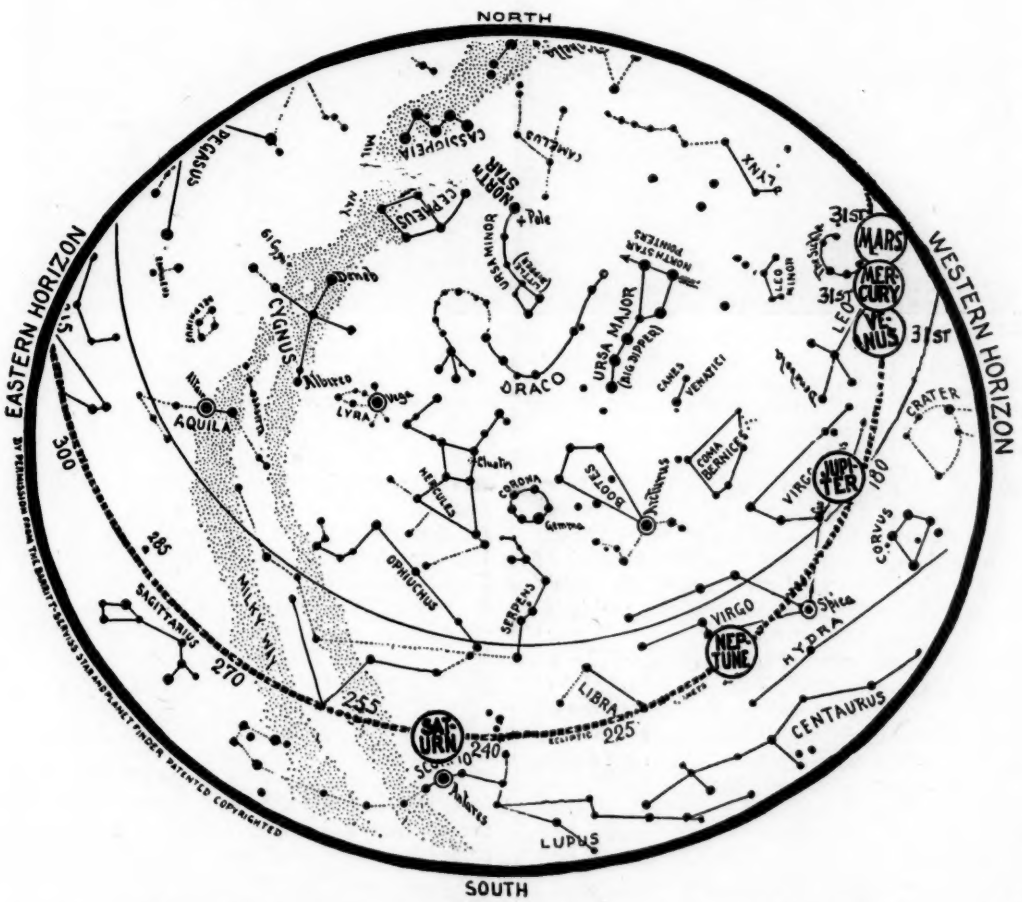
UNIVERSITY OF MINNESOTA SCIENCE LIBRARY JUL 15 1957

EVENING SKY MAP FOR JULY



AT 9:30 P.M., JULY 1 **8:30 P.M., JULY 15** **7:30 P.M., JULY 31**

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

XUM

JULY EVENING SKIES

The Stars and Constellations

THE RING NEBULA IN LYRA

This famous nebula can be seen easily in amateur equipment. A six-inch telescope will show the ring distinctly. It appears elliptical. The star in the center is faint and not readily seen in a moderate sized telescope.

Almost in the zenith hangs the beautiful *Northern Crown Corona Borealis,* a constellation so striking in form that we cannot wonder at its recognition under the name of a crown among the earliest peoples. The Greeks called it *Ariadne's* crown. The "Pearl" of the crown is a beautiful star of the second magnitude, set in its front, which is turned toward the south. West of the *Northern Crown* stands *Bootes,* with the great *Arcturus* glittering like a superb pendant hanging from the giant's girdle. East of the crown is *Hercules,* clearly marked by an irregular quadrilateral figure formed by four fairly bright stars. Draw an imaginary line from the star at the northwestern corner of this figure to the one at the southwestern corner, and close to this line, at about one-third of its length, will be seen a faint glimmering speck, plainly visible with an opera-glass; this is the celebrated Star Cluster of *Hercules,* one of the greatest telescopic wonders in the heavens. Its stars are packed together as thick as a swarm of bees, and when photographed it presents an astonishing spectacle. There are probably twelve or fifteen thousand suns crowded together in this astonishing stellar ball!

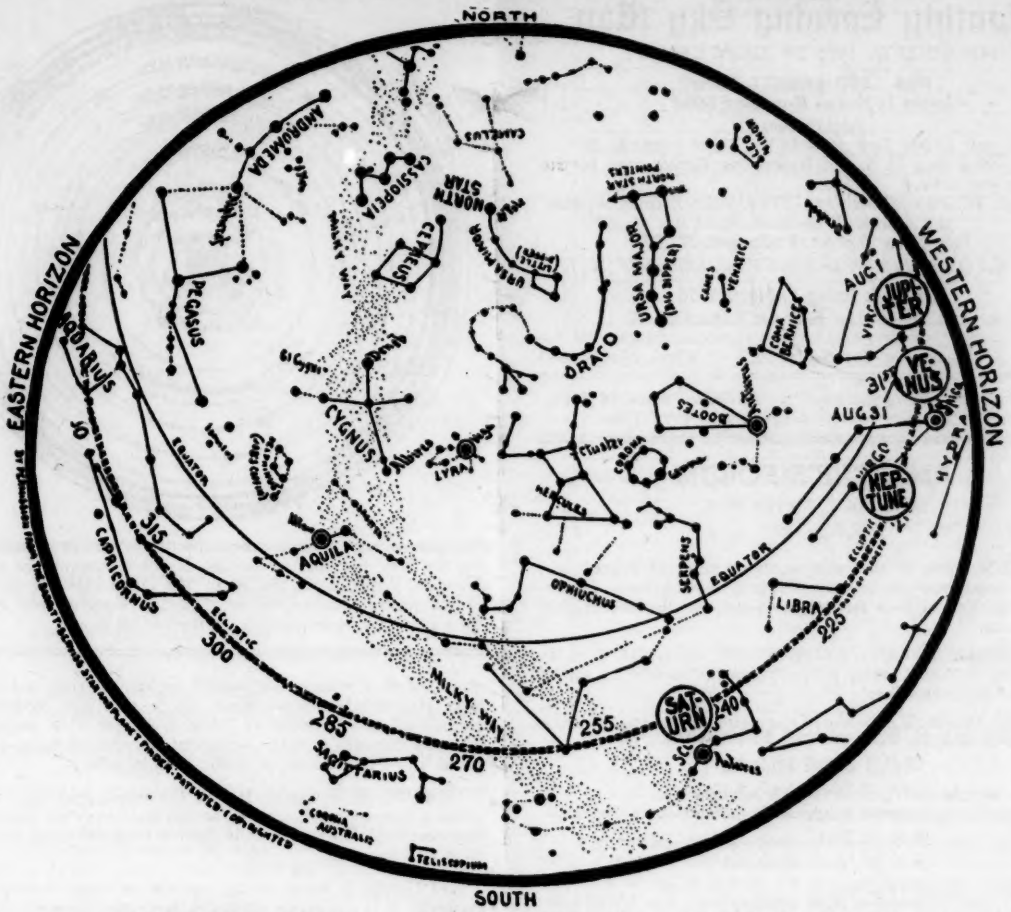
Beyond *Hercules,* still farther east, glows the brilliant little constellation of the *Lyre,* whose beauty is largely due to the singular splendor of its chief *Vega,* or *Alpha Lyrae.* In the beauty of its blue-white rays *Vega* has few rivals. Look at it if possible with a telescope. Near *Vega* are two fourth magnitude stars which make a little triangle with their great neighbor. Both of these stars are telescopically double, but the northernmost one, *Epsilon,* is twice double, i. e., it consists of four stars joined in pairs, and, if we turn our telescope a few degrees to the south, to a point roughly between the stars *Beta* and *Gamma Lyrae,* we will pick up the famous Ring Nebula (see cut).

Yet lower in the northeast, below *Lyra,* appears the conspicuous figure of the *Northern Cross* in the constellation *Cygnus.* This lies exactly in the *Milky Way* which is very brilliant here. The bottom star in the foot of the *Cross* is one of the most beautiful doubles in the whole sky. It is named *Beta Cygni,* or *Albireo,* and consists of a small deep blue star joined with a much larger golden yellow one. The smallest telescope suffices to separate this double, whose components are more than half a minute of arc apart.

East of the *Northern Cross* is seen the curious little constellation *Delphinus the Dolphin,* sometimes called *Job's Coffin,* while southeast shines *Aquilla,* the *Eagle,* with the brilliant *Altair* which has a smaller star at a little distance on each side of it.

XUM

EVENING SKY MAP FOR AUGUST



AT 9:00 P.M. AUG. 1 8:00 P.M., AUG. 15 7:30 P.M., AUG. 31

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

In the north the *Little Dipper* stands upright on the end of its handle, marked by the *Pole Star,* while between it and the zenith curves the crooked *Dragon.* The *Great Dipper,* bowl downward, is west of the meridian, and *Cassiopeia* is near the horizon in the northeast. The Sickle of *Leo* is near setting in the west, and *Spica* in *Virgo* gleams at a good elevation in the southwest. Almost directly south, rapidly approaching the meridian, appears *Scorpio,* a very remarkable constellation on account both of its striking shape and the peculiarly fiery color of its principal star *Antares.* In *Antares* the observer with a telescope finds another exceedingly fine object. It is a double, the larger of whose stars is of the first magnitude and red, while the smaller, which is very close in the rays of its great companion, is brilliant green. It requires a telescope of at least four inches aperture and of first-class quality to show satisfactory the little green companion of *Antares,* but when it is well seen there is hardly a more charming object to be found in the starry heavens. Sometimes when *Antares* is occulted by the Moon the beautiful spectacle of the green star emerging alone from behind the moon a few seconds ahead of the red one may be witnessed. These occasions, however, are very rare.

The *Milky Way* passes between *Scorpio* and *Sagittarius,* which lies farther east, and in the absence of the Moon resembles a row of faint silvery clouds dipping beneath the southern horizon. Up in the direction of *Aquila* the *Milky Way* attains its maximum brilliancy in a group of veritable star clouds, the same of which Barnard has made wonderful photographs.

There are a number of meteor showers in July, but none of them of much brilliancy.

The earth is in aphelion, or at its point of greatest distance from the Sun on July 2. It will then be about 3,000,000 miles farther from the Sun than it was at the beginning of January. But in January the northern hemisphere leans away from the Sun, and the latter appears low in the south, so that in spite of its relative nearness at that time its rays are less effective in heating our part of the earth, and so we have winter. In July our hemisphere leans toward the Sun, and this very much more than counterbalances the effect of the increased distance. The total amount of heat received by the whole earth from the Sun at the beginning of January is about seven per cent greater than at the beginning of July, but the extra heat is mainly expended on the vast oceanic surfaces of the southern hemisphere.

XUM

The
Monthly Evening Sky Map
FOUNDED IN 1905 BY LEON BARRITT

MRS. LEON BARRITT, Editor
Irving L. Meyer, Managing Editor

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All time is expressed in Eastern (75th Meridian) Standard Time. Add five hours to convert to Greenwich Civil Time.

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.
JULY, 1957

THE SUN: close to the most northerly point of the ecliptic, gradually commences to curve southward, moving from Gemini into Cancer. The earth is farthest from the Sun the 2nd at 94.5 million miles.

THE MOON: is at *apogee* (farthest from the earth) the 15th at a distance of 252,000 miles. It is at *perigee* (closest to the earth) the 28th at 223,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

July	1	North limb, 6.6°
July	7	West limb, 5.7°
July	14	South limb, 6.6°
July	23	East limb, 7.2°
July	28	North limb, 6.5°

The Moon's phases (E.S.T.):

First Quarter	July 4 at	7:09 am
Full Moon	11 at	5:50 pm
Last Quarter	19 at	9:17 pm
New Moon	26 at	11:28 pm

MERCURY: is too close to the Sun the entire month to be easily observable. It opens the month in Gemini as a morning "star". On the 4th it is in superior conjunction with the Sun, thereupon entering the evening sky. It speeds through Cancer, to a point in Leo near Regulus. It is in very close conjunction with Mars on the 23rd, and by the end of the month is close to venus. Though several magnitudes fainter than Venus, it is still bright and should be visible in the bright twilight. Maximum geocentric distance, the 6th, is 123 million miles.

VENUS: is still close to the Sun, but can be seen in the evening sky right after sunset. It travels from Cancer into Leo. and at month-end will serve as a guide to Mercury, the latter being just to the west. Distance from the earth decreases from 146 million miles the 1st to 133 million miles the 31st. Brightness remains unvariable at -3.3 magnitude.

MARS: is in the evening sky, and moves from Cancer into Leo. It is a second magnitude object now, and is too close to the Sun for worthwhile observation. It is 232 million miles away the 1st, and is 242 million miles away the 31st.

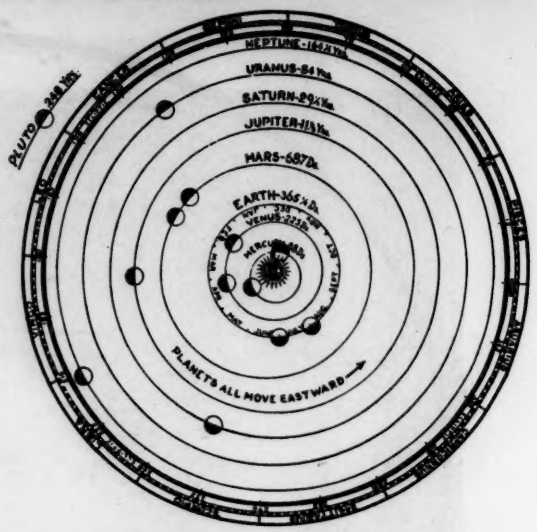
JUPITER: is in Virgo, just north of the equator, and still pretty well placed for observation. It sets shortly before midnight. Jupiter is probably the most readily observed of all planets due to its immense size and the large disc it presents under moderate telescopic magnification. The polar flattening (Jupiter's disc appears as an oval) and shadowy bands across the disc are easy to see. Of course, the four major satellites are most interesting. Distance the 15th is 541 million miles.

SATURN: is the real ruler of the night sky. Just north of Antares in Scorpio, this planet moves slowly in an extremely rich star field. It ranks with Jupiter as a most wonderful telescopic object, with a unique and readily discernible ring system. Also, there are several satellites which can be seen with modest optical aid, though not so bright as Jupiter's. On the 15th, magnitude is 0.5, ring diameter is 40½" equatorial diameter of the globe of the planet is 18", and distance is 861 million miles.

URANUS: is in Cancer. It is in the evening sky until the 30th when it is in conjunction with the Sun and enters the morning sky. Not observable all month. It is farthest from the earth the 30th at 1814 million miles.

NEPTUNE: is south of the equator in Virgo, setting around midnight. It is observable all month, but is not visible to the naked eye, as its magnitude is 8. A telescopic power of 100 diameters will show its disc. Refer to the January - March 1957 "MAP" for a detailed chart of the positions of Neptune. Distance the 15th is 2803 million miles.

HELIOCENTRIC POSITIONS OF THE PLANETS, JULY



The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month are given for Mercury, Venus, Earth, and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus, Neptune, and Pluto are shown in their mean position for the current month.

ASTRONOMICAL CALENDAR

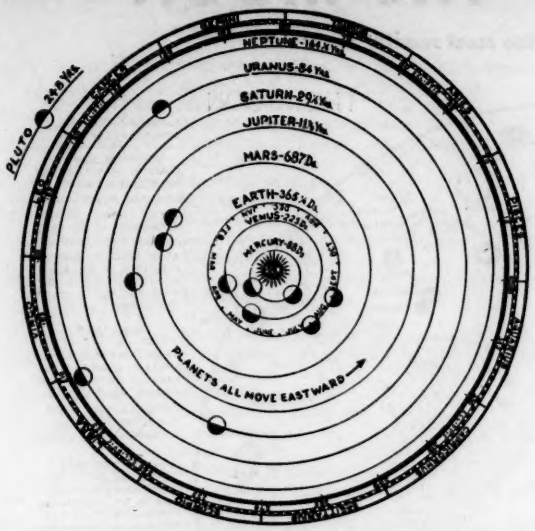
Eastern Standard Time

JULY, 1957

July	1—10:20 pm	Minimum of Algol
	2— 8:— pm	Earth in aphelion
	3— 5:12 am	Conjunction, Jupiter and Moon; Jupiter north 5° 43'
	4—12:— am	Superior conjunction, Mercury and Sun; Mercury north 1° 20'
	4— 7:09 pm	Minimum of Algol
	5— 4:03 pm	Conjunction, Neptune and Moon; Neptune north 3° 30'
	5— 7:— pm	Conjunction, Venus and Uranus; Venus north 1° 0'
	7— 3:58 pm	Minimum of Algol
	8—12:14 pm	Conjunction, Saturn and Moon; Saturn north 0° 1'
	10— 6:— am	Mercury greatest heliocentric latitude north
	10—12:46 pm	Minimum of Algol
	11— 6:— am	Venus greatest heliocentric latitude north
	11— 2:— pm	Conjunction, Venus and Mars; Venus north 0° 25'
	12— 5:— am	Neptune stationary in Right Ascension
	13— 9:35 am	Minimum of Algol
	15— 5:— pm	Conjunction, Mercury and Uranus; Mercury north 1° 15'
	16— 6:24 am	Minimum of Algol
	19— 3:12 am	Minimum of Algol
	22—12:01 am	Minimum of Algol

XUM

HELIOCENTRIC POSITIONS OF THE PLANETS, AUGUST



22— 7:— pm Quadrature, Neptune and Sun
23— 5:— pm Conjunction, Mercury and Mars; Mercury north 0° 7'
24— 8:49 pm Minimum of Algol
27— 6:56 am Conjunction, Uranus and Moon; Uranus north 5° 45'
27— 5:38 pm Minimum of Algol
28— 9:44 am Conjunction, Mars and Moon; Mars north 6° 27'
28— 5:34 pm Conjunction, Mercury and Moon; Mercury north 5° 56'
29— 3:02 am Conjunction, Venus and Moon; Venus north 6° 39'
30— 1:— pm Conjunction, Uranus and Sun
30— 2:26 pm Minimum of Algol
30— 6:41 pm Conjunction, Jupiter and Moon; Jupiter north 5° 10'
30— 9:— pm Mars in aphelion

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

AUGUST, 1957

THE SUN: is following a south-eastwardly path along the ecliptic, moving out of Cancer into Leo. The earth's distance decreases slightly—from 94.3 million miles the 1st, to 93.8 million miles the 31st.

THE MOON: is farthest from the earth the 12th at 252,000 miles, and is closest the 25th at 222,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

August 4 West limb, 6.9°
August 10 South limb, 6.6°
August 20 East limb, 7.7°
August 24 North limb, 6.5°

The Moon's phases (E.S.T.):

First Quarter	August	2 at 1:55 pm
Full Moon		10 at 8:08 am
Last Quarter		18 at 11:16 am
New Moon		25 at 6:32 am
First Quarter		31 at 11:34 pm

MERCURY: travels from Leo into Virgo, and is in the evening sky the entire month. The best time to observe this elusive planet is for a few days around the 13th, the date on which it makes its greatest elongation from the Sun. Though much better situated for southern hemisphere observers, keen eyed observers in the north will have no trouble spotting Mercury. Mercury will be a little brighter than a standard first magnitude star, and in the telescope will look like the Moon at quarter phase—half illuminated. Remember, it sets by the time total darkness falls, so you must look for it in the twilight band, close to the western horizon. Distance the 1st is 100 million miles, decreasing to 62 million miles the 31st.

SATELLITES OF JUPITER

JULY

Day	West							East						
1			4	2			3							1 ●
2		4			1 2		2							
3	4		3				1 2							
4	4			3	1 2									
5		4			2	3	1							
6			4		1			3 2						
7				4			1 2		3					
8				2				1 2	3					
9	○1				3	○		4						2 ●
10			3			○	1	2		4				
11			3		1 2	○					4			
12				3 2		○	1					4		
13					1	○		3 2				4		
14						○	1 2		3	4				
15			2		1	○			3	4				
16					1 3	○	2	4						
17			3	4		○		2						1 ●
18			3 4		1 2	○								
19		4		3 2		○	1							
20	4			1		○	3	2						
21	4					○	1 2		3					
22		4		2	1	○			3					
23			4		2	○	1 2							
24				3 4		○		2						1 ●
25	○2		3		1	○	4							
26				3 2		○	1	4						
27				1		○	2			4				3 ●
28						○	1 2	3			4			
29				2	1	○			3			4		
30					2	○	1 2				4			
31				3	1	○		2		4				

Appearance of Jupiter and its satellites at 9:45 P.M., E.S.T. as seen in an inverting telescope

JUPITER: still visible in the evening sky in Virgo, practically astride the equator. Observation is now very limited, as it sets not long after the Sun. At the end of the month it is only a few degrees from Mercury and, together with Venus, forms an interesting triangle. This grouping can only be seen as darkness falls. Distance the 15th is 576 million miles.

SATURN: sets shortly after midnight most of the month. It is well placed for observation. If you have access to a telescope, this is one of the most rewarding planets. The ring system is wonderful, and can be detected under very low power. Higher powers, coupled with good resolution, will show Cassini's Division in the ring system. On the 15th, magnitude is 0.7, and distance is 902 million miles.

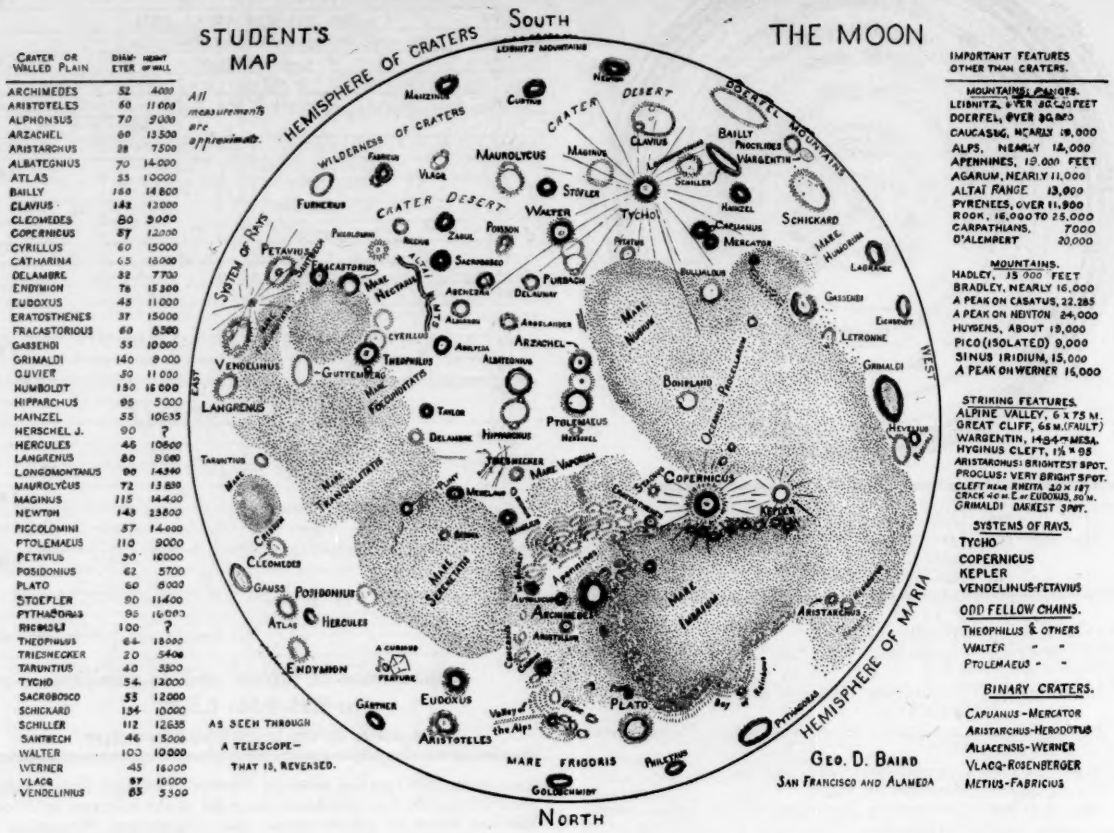
URANUS: in Cancer, is too close to the Sun the entire month to be observable. It is in the morning sky, rising just before the Sun. Distance from the earth is 1811 million miles the 15th.

NEPTUNE: is in the evening sky in Virgo, setting well before midnight. Not visible to the naked eye, at best this is a dull and uninteresting telescopic object. Magnitude is 8 and distance 2851 million miles the 15th.

XUM

LET'S LOOK AT THE MOON

Our nearest Celestial neighbor is the most readily observed.



CRATER OR WALLED PLAIN	DIAMETER	HEIGHT OF WALL
ARCHIMEDES	52	4000
ARISTOTELES	60	11 000
ALPHONSUS	70	9000
ARZACHEL	60	13 500
ARISTARCHUS	28	7500
ALBATEGNIUS	70	14 000
ATLAS	55	10000
BAILLY	150	14 800
CLAVIUS	182	12000
CLEOMEDES	80	9000
COPERNICUS	57	12000
CYRILLUS	60	15000
CATHARINA	65	16000
DELAMBRE	32	7700
ENDYMION	78	15 300
EUDOXUS	45	11000
ERATOSTHENES	37	15000
FRACASTORIUS	60	8580
GASSENDI	55	10000
GRIMALDI	140	8000
GUVIER	80	11 000
HUMBOLDT	130	16 000
HIPPARCHUS	95	5000
HAINZEL	55	10635
HERSCHEL J.	90	?
HERCULES	46	10500
LANGRENUS	80	9000
LONGOMONTANUS	90	14340
MAUROLYCUS	72	13 830
MAGINUS	115	14400
NEWTON	143	23800
PICCOLOMINI	87	14000
PTOLEMAEUS	110	9000
PETAVIUS	90	10000
POSIDONIUS	62	5700
PLATO	60	6000
STOEFLER	90	11400
PYTHAGORAS	95	16000
RICCIOLI	100	?
THEOPHILUS	64	18000
TRIESNECKER	20	5400
TARUNTIUS	40	3300
TYCHO	54	12000
SACROBOSCO	53	12000
SCHICKARD	134	10000
SCHILLER	112	12635
SANTBECH	46	15000
WALTER	100	10000
WERNER	45	16000
VLACQ	87	16000
VENDELINUS	83	5300

IMPORTANT FEATURES OTHER THAN CRATERS.

MOUNTAINS; RANGES.
LEIBNITZ, OVER 30,000 FEET
DOERFEL, OVER 30,000
CAUCASUS, NEARLY 19,000
ALPS, NEARLY 18,000
APENNINES, 19,000 FEET
AGARUM, NEARLY 11,000
ALTAI RANGE 13,000
PYRENEES, OVER 11,000
ROOK, 16,000 TO 25,000
CARPATHIANS, 7000
D'ALEMBERT 20,000

MOUNTAINS.
HADLEY, 15 000 FEET
BRADLEY, NEARLY 16,000
A PEAK ON CASATUS, 22,285
A PEAK ON NEWTON 24,000
HUYGENS, ABOUT 19,000
PICO (ISOLATED) 9,000
SINUS IRIDIUM, 15,000
A PEAK ON WERNER 15,000

STRIKING FEATURES.
ALPINE VALLEY, 6 x 75 M.
GREAT CLIFF, 66 M. (FAULT)
WARGENTIN, 1434 FT. MESA.
HYGINUS CLEFT, 1½ x 98
ARISTARCHUS: BRIGHTEST SPOT.
PROCLUS: VERY BRIGHT SPOT.
CLEFT NEAR RHEITA 20 x 187
CRACK 40 M. E. OF EUDOXUS, 50 M.
GRIMALDI DARKEST SPOT.

SYSTEMS OF RAYS.
TYCHO
COPERNICUS
KEPLER
VENDELINUS-PETAVIUS

ODD FELLOW CHAINS.
THEOPHILUS & OTHERS
WALTER " "
PTOLEMAEUS " "

BINARY CRATERS.
CAPUANUS-MERCATOR
ARISTARCHUS-HERODOTUS
ALIACENSIS-WERNER
VLACQ-ROSENBERGER
METIUS-FABRICIUS

No planetary object is as close to the earth as our satellite, the Moon. Mars, at its closest, is more than 140 times as far away as the Moon. Small wonder, then, that this is the most readily observed object in the skies.

These warm summer nights are ideal, particularly following the Full Moon, since the calm air, coupled with the fact that the Moon is on the ascending point in the ecliptic, brings our satellite into fine observing position little later each night. The Full Moon this September is, technically, the Harvest Moon and that of October is the Hunter's Moon. The Harvest Moon is the Full Moon which falls nearest the Autumnal Equinox; the Hunter's Moon; the one immediately following. You will note that the Moon rises only about a half hour later each night, whereas following a spring Full Moon this difference is about an hour and one quarter.

The finest detail can be seen on the Moon along the *terminator*—the Sunrise of Sunset line. And it has always seemed to the writer, the most interesting detail can be seen on the waning Moon, particularly the Harvest Moon, when, progressively, the terminator crosses such areas as the Mare Crisium, the crater Theophilus, the Apennines Mountains, the crater Copernicus, and the Oceanus Procellarum, and the lengthening shadows make these objects stand out in bold relief.

Our little map, reproduced above, should whet your appetite. It is not intended to be a comprehensive reproduction such as Elger's map, but rather a guide to the most interesting and prominent formations. Further, the reader should realize that tremendous power on a giant telescope is *not* necessary to get the most of lunar observations. Realize that the dark areas called *Maria* (Latin for seas) are readily visible to the naked eye, as well as prominent bright spots such as Copernicus. Now, implement the eye with some optical assistance—say good binoculars. Immediately the more prominent craters and mountain ranges can be seen. Now if we go to a one inch telescope, and hold or mount it steadily, we can apply higher power—30 or 40 times—and though the brightness of the image will be greatly reduced the detail visible will increase as greatly. There is little limit to our researches if we can graduate to a six of twelve inch reflector, particularly if equatorially mounted and clock-driven. Here we can apply 200 power profitably, and minute details of the Moon's face will be detectable.

In any event, with any opera glasses or binoculars or telescope, take our little map out in the cool of the evening and scrutinize the Moon. You will get a thrill out of identifying the famous craters, mountains and seas depicted thereon.

ASTRONOMICAL CALENDAR

Eastern Standard Time
AUGUST, 1957

August	1— 9:53 pm	Conjunction, Neptune and Moon; Neptune north 3° 13'
	2—11:15 am	Minimum of Algol
	2— 4:— pm	Mercury in descending node
	4— 4:03 pm	Conjunction, Saturn and Moon; Saturn south 0° 12'
	5— 8:04 am	Minimum of Algol
	8— 4:52 am	Minimum of Algol
	11— 1:41 am	Minimum of Algol
	12— 3:— am	Saturn stationary in Right Ascension
	12—11:— pm	Mercury in aphelion
	13—10:— am	Mercury greatest elongation east, 27° 26'
	13—10:29 pm	Minimum of Algol
	16— 7:18 pm	Minimum of Algol
	19— 4:06 pm	Minimum of Algol
	22—10:— am	Conjunction, Venus and Jupiter; Venus south 0° 28'
	22—12:15 pm	Minimum of Algol
	23— 9:— am	Conjunction, Pluto and Sun
	23— 8:21 pm	Conjunction, Uranus and Moon; Uranus north 5° 49'
	25— 9:44 am	Minimum of Algol
	26—12:50 am	Conjunction, Mars and Moon; Mars north 5° 49'
	26— 2:— pm	Mercury stationary in Right Ascension
	26— 6:57 pm	Conjunction, Mercury and Moon; Mercury south 0° 17'
	27—11:52 am	Conjunction, Jupiter and Moon; Jupiter north 4° 34'
	27— 8:16 pm	Conjunction, Venus and Moon; Venus north 3° 25'
	28— 6:32 am	Minimum of Algol
	29— 6:13 am	Conjunction, Neptune and Moon; Neptune north 2° 55'
	31— 3:21 am	Minimum of Algol
	31—Noon	Quadrature, Saturn and Sun
	31—10:33 pm	Conjunction, Saturn and Moon; Saturn south 0° 34'

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.
SEPTEMBER, 1957

THE SUN: moves from Leo, crosses the equator *(Equinox)* and penetrates well into Virgo. Distance the 1st is 93.7 million miles, decreasing to 93.0 million miles the 30th.

THE MOON: is at *apogee* the 8th at 252,000 miles, and is at *perigee* the 23rd at 222,000 miles distance.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

September 1	West	limb, 7.7°
September 6	South	limb, 6.6°
September 17	East	limb, 7.4°
September 21	North	limb, 6.6°
September 29	West	limb, 7.6°

The Moon's phases (E.S.T.):

Full Moon	September 8 at 11:55 pm
Last Quarter	16 at 11:02 pm
New Moon	23 at 2:18 pm
First Quarter	30 at 12:49 pm

MERCURY: spends the entire month in Virgo, first as an evening star and then, after inferior conjunction with the Sun on the 9th, as a morning star. Mercury's motion is so rapid that by the 25th is at greatest elongation again—this time in the morning sky, west of the Sun. So for a few days around the 25th it will be observable low in the eastern pre-dawn sky, close to the horizon. Magnitude will be about 0.0, and illumination of the disc, as seen from the earth, about 40%. Mercury is closest to the earth the 7th at 59 million miles.

VENUS: our brilliant (magnitude -3.5) evening star, moves well below the equator, from Virgo into Libra. It now sets well after the Sun. In the telescope (low power is all that is needed) it is 3/4 illuminated, looking *gibbous*, like the Moon between quarter and full phases. Look pretty low in the west for this brilliant gem, as dusk descends. Distance the 1st is 115 million miles, as against 96 million miles the 30th.

MARS: is not observable. It commences the month in the evening sky on the Leo-Virgo boundary; is in conjunction with the Sun the 21st, thereupon entering the morning sky; and concludes the month a morning star, close to the Sun, in Virgo. It is most remote from the earth the 10th at 247 million miles.

JUPITER: just south of the equator in Virgo, it is in the evening sky all month, but too close to the Sun to be observable. Distance the 15th is 596 million miles.

SATURN: remains in the Ophiuchus-Scorpio area, in the evening sky. It sets, now, well before midnight, but still will give a short period of observability. The ring system is beautiful, but the boiling of the atmosphere will cause much distortion in the telescope. This planet is soon to disappear until next season. Distance the 15th is 949 million miles.

URANUS: is far south of the equator in Cancer. It can be picked up just before sunrise, but, as it is on the borderline of naked-eye visibility, is easiest seen with optical aid. A moderate telescopic magnification reveals a neat, round, greenish disc. Distance the 15th is 1787 million miles.

NEPTUNE: is in Virgo all month, in the evening sky. It is much too close to the Sun to be an easy object. It is not visible to the naked eye. On the 15th, distance is 2889 million miles, magnitude is 8, and apparent diameter 2.4".

ASTRONOMICAL CALENDAR

Eastern Standard Time
SEPTEMBER, 1957

Sept.	2— 7:— am	Mercury greatest heliocentric latitude south
	3—12:09 am	Minimum of Algol
	5— 7:— am	Venus in descending node
	5— 8:58 pm	Minimum of Algol
	5— 9:— pm	Conjunction, Mercury and Mars; Mercury south 5° 39'
	7— 9:— am	Jupiter greatest heliocentric latitude north
	8— 5:46 pm	Minimum of Algol
	9— 3:— pm	Inferior conjunction, Mercury and Sun; Mercury south 3° 33'
	11— 2:35 pm	Minimum of Algol
	14—11:23 am	Minimum of Algol
	15— 2:— pm	Conjunction, Venus and Neptune; Venus south 2° 28'
	17— 8:12 am	Minimum of Algol
	18— 3:— am	Mercury stationary in Right Ascension
	20— 5:01 am	Minimum of Algol
	20— 9:01 am	Conjunction, Uranus and Moon; Uranus north 5° 59'
	21— 7:— am	Mercury in ascending node
	21—10:— am	Conjunction, Mars and Sun
	22—12:30 pm	Conjunction, Mercury and Moon; Mercury north 5° 2'
	23— 1:49 am	Minimum of Algol
	23— 2:27 am	Sun enters *sign* of Libra; Equinox
	23— 4:05 pm	Conjunction, Mars and Sun; Mars north 4°33'
	24— 7:29 am	Conjunction, Jupiter and Moon; Jupiter north 4° 0'
	25— 2:— pm	Mercury greatest elongation west, 17° 52'
	25— 5:14 pm	Conjunction, Neptune and Moon; Neptune north 2° 40'
	25—10:38 pm	Minimum of Algol
	25—11:— pm	Mercury in perihelion
	26— 1:12 pm	Conjunction, Venus and Moon; Venus south 1° 39'
	28— 8:56 am	Conjunction, Saturn and Moon; Saturn south 0° 59'
	28— 7:27 pm	Minimum of Algol

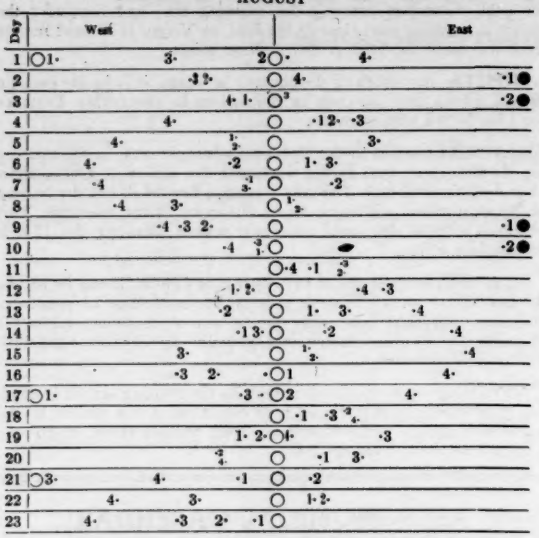
1566 ICARUS

One of our closest neighbors in space, the asteroid Icarus, makes a not-very-close approach to the earth late in June and early July. The closest point reached is about 74 million miles from us. And observation is restricted to the largest telescopes, as Icarus will shine at magnitude 19'. It will be in the constellation Microscopium (south of Capricornus), and retrogrades into Sagittarius and Corona Australis.

XUM

SATELLITES OF JUPITER

AUGUST

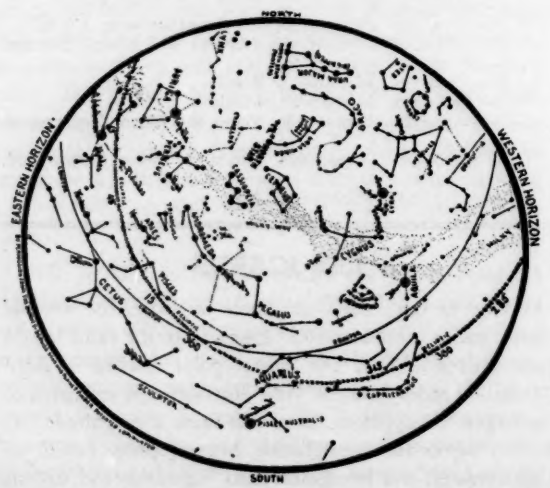


Appearance of Jupiter and its satellites at 8:30 P.M., E.S.T. as seen in an inverting telescope

Jupiter is represented by the disc in the center of the chart, and each satellite by a dot and its appropriate number. The direction of the staellite's motion is from the dot toward the numeral. The numeral and light disc at the left margin of the chart indicates a satellite in transit across Jupiter's disc; the numeral and dark at the right margin indicates a satellite which is invisible because it is being eclipsed or occulted by Jupiter. This chart must be held upside down if binoculars, opera glasses, or an erecting type telescope is used.

Because of Jupiter's nearness to the Sun, the charts of satellites are omitted for the period August 24th to October 20th.

MORNING SKY MAP FOR JULY



At 4:00 A.M., July 1; 3:00 A.M., July 15; 2:00 A.M., July 31

SEPTEMBER EVENING SKIES

The Stars and Constellations

One of the glories of the September sky is the vast arch of the *Milky Way,* spanning the heavens from the northeast to southwest. Some of its richest portions are seen high overhead in the constellation *Cygnus,* marked by the striking figure of the "Northern Cross." The *Milky Way* is also very bright where it dips toward the southern horizon between *Scorpio* and *Sagittarius.* In the northern part of the sky it appears most brilliant in *Cassiopia* and *Perseus.* There is no greater pleasure for the possessor of a small telescope than to follow the course of the *Milky Way* throughout its whole visible extent, using the lowest magnifying powers with which the glass is equipped. A power of 25 diameters on a three-inch telescope will reveal clouds upon clouds of glittering stars so small and so innumerable that they resemble diamond dust strewn upon a black background. Here and there the *Milky Way* gathers in knots and spirals which are wonderful to look upon.

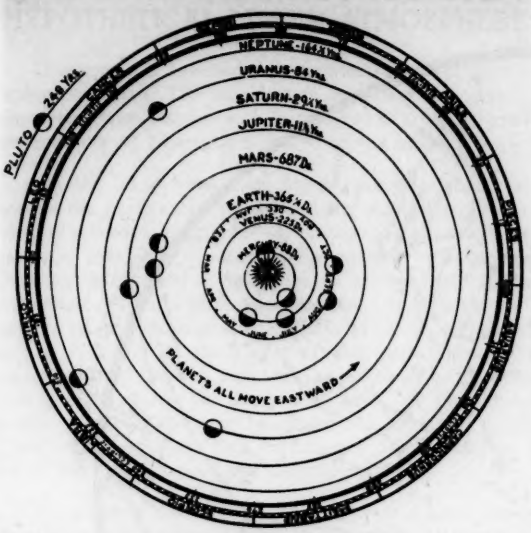
The *Milky Way* may serve us on this occasion as a sort of highway dividing the visible constellations into two great fields. Five stars usually ranked as the first magnitude are visible, namely, *Arcturus,* in *Bootes,* now low in the west; *Vega,* in *Lyra,* high overhead; *Altair,* in *Aquila; Formalhaut,* in *Pisces Australis* and *Capella,* in *Auriga,* which is just rising far round in the northeast. Of these five, three are in reality much brighter than a standard first magnitude star; they are *Capella, Vega* and *Arcturus.* Every one of them is not only a very bright object in the sky, but also a much larger sun than ours, exceeding it, perhaps, not less than a thousand times in light-giving power. Each may be the center of a vast system of planets. But *Capella* is double, composed of two enormous suns close together, a fact which introduces many complications from the point of view of an attendant planetary system.

The readers will observe that the *"Great Dipper"* in *Ursa Major,* has now descended below the pole in the northwest while *Cassiopeia,* opposite to it, has attained a comparatively great elevation in the northeast. It is always interesting to watch the "balancing" of these two constellations, which seem to play at see-saw, with the *Pole Star* for their pivot.

Andromeda is now becoming conspicuous in the west and northwest. The reader will observe that the star *Alpheratz,* at the northeast corner of the Great Square of *Pegasus,* is common to the constellations *Pegasus* and *Andromeda.* In reality, however, it should be assigned to *Andromeda* alone, and it is counted for *Pegasus* simply because it serves to complete the figure of the "Square." *Alpheratz* is represented in the old constellation figures, such as those drawn by the celebrated German artist, Albrecht Durer, for Flamsteed's "Celestial Atlas," as shining in the forehead of *Andromeda.* It is a star of the second magnitude. Two other stars of the same magnitude from a line with it, stretching downward toward the horizon, the first of these in *Andromeda's* girdle and the second in her foot.

Between *Andromeda* and the Pole is *Cassiopeia,* and below her feet in the northeast appears *Perseus.* The story of these constellations is one of the most interesting instances of the connection between ancient mythology and the imaginary figures in the starry heavens. *Andromeda* represents the beautiful daughter of *Cassiopeia,* queen of Ethiopia, who was chained to a rock by the seaside to be devoured by a sea monster as a punishment for her mother

HELIOCENTRIC POSITIONS OF THE PLANETS, SEPTEMBER



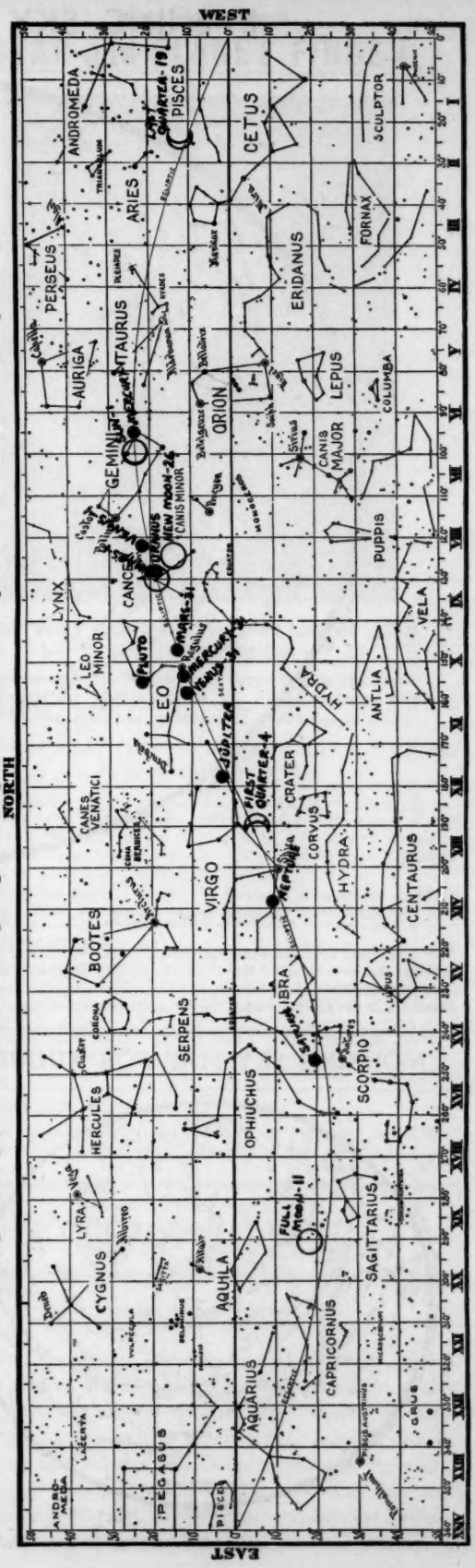
The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month are given for Mercury, Venus, Earth, and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus, Neptune, and Pluto are shown in their mean position for the current month.

Cassiopeia, who had boasted herself as fairer than the sea nymphs. According to the fable she was rescued by the hero *Perseus* who froze the sea monster into stone by presenting before its eyes the head of the snake tressed *Gorgon,* which he had cut off. A curious fact in connection with this legend is that attached, as it were, to the constellation *Perseus* is a small group of stars comprising one of the most wonderful objects in the heavens. *Algol,* this star, whose position is clearly indicated on the chart, varies, in a period less than three days, to such a degree that it is at certain periods several times brighter than at others. The changes take place in regular order, giving to the star the look, as has been somewhat fancifully said, of "a slowly winking eye." The word "Algol" in Arabic means "The Demon" and it is at least a curious coincidence that so strange an object should be attached to the constellation *Perseus,* when we recall the story of that constellation, as just given.

The Sun enters the Zodiacal sign Libra, and the astronomical Autumn begins at 2:27 o'clock on the morning of the 23rd. This is called the Autummal equinox, and the position of the Sun at this epoch is indicated on the chart by the crossing of the lines of the equator and the ecliptic at the figures 180. The ecliptic being the apparent path of the Sun through the heavens, the reader will notice that after passing the Autummal equinox his course will lie constantly below or south of tthe equator, until he returns into the northern hemisphere after six months at the crossing point on the opposite side of the chart known at the vernal equinox. When the Sun is at either of the two equinoxes day and night are of equal length all over the world. As he descends south of the equator the night begins to exceed the day in length in the northern hemisphere.

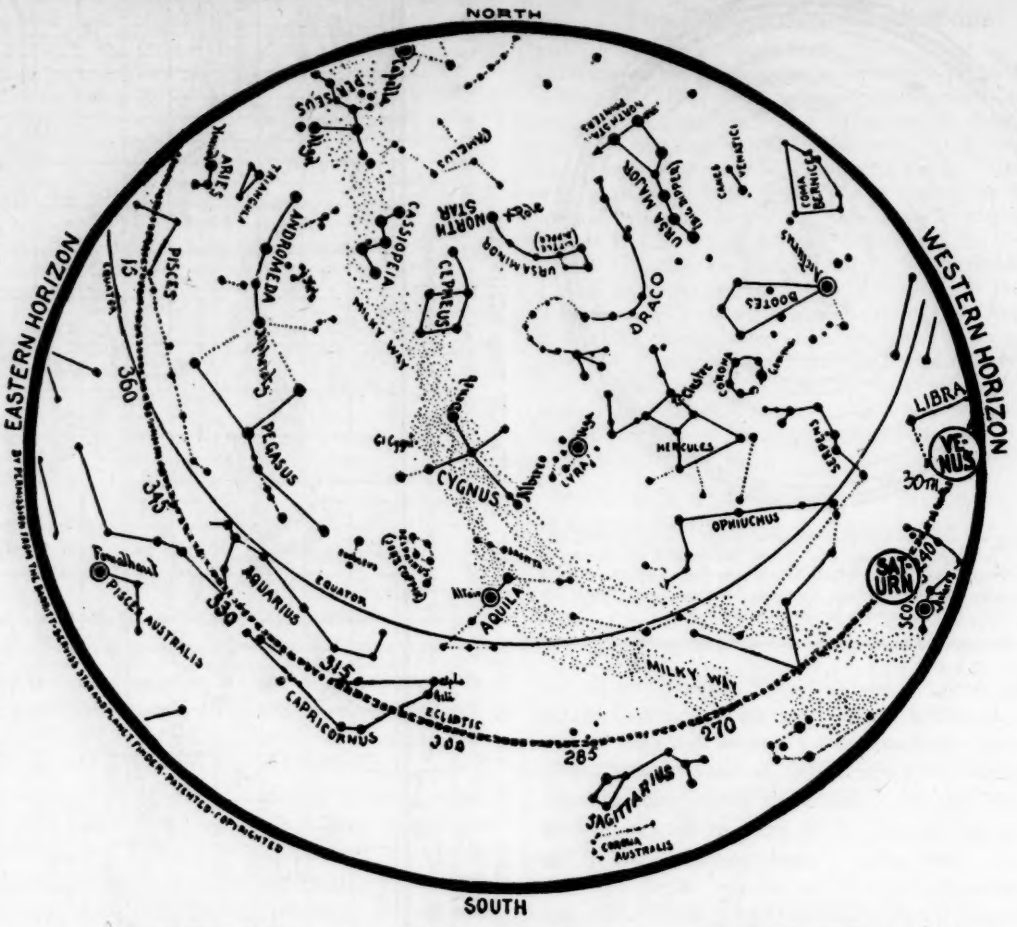
A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current month—July, 1957—Anywhere in the world.
Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.



XUM

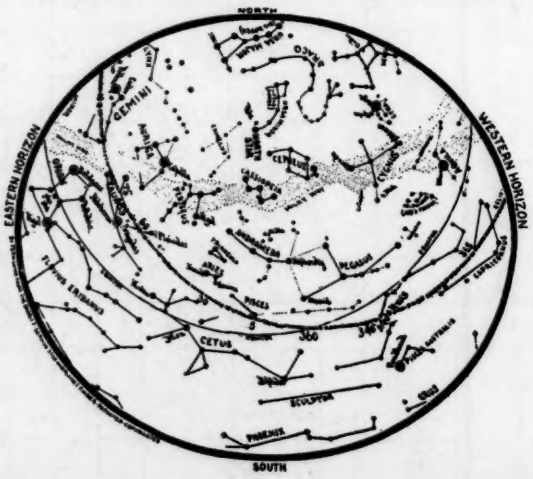
EVENING SKY MAP FOR SEPTEMBER



AT 9:00 P.M., SEPT. 1 8:00 P.M., SEPT. 15 7:00 P.M., SEPT: 30

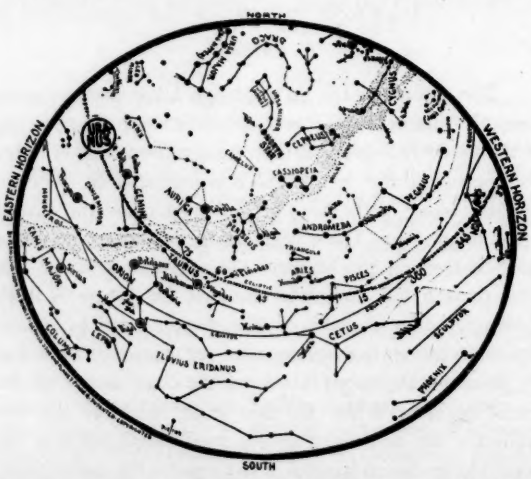
Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

MORNING SKY MAP FOR AUGUST



At 4:00 A.M., Aug. 1; 3:00 A.M., Aug. 15; 2:00 A.M., Aug: 31

MORNING SKY MAP FOR SEPTEMBER



At 4:30 A.M., Sept. 1; 3:30 A.M., Sept. 15; 2:30 A.M., Sept: 30

ON THE DENSITY OF A HYPOTHETICAL LUNAR ATMOSPHERE

It is generally believed that the moon does not have an atmosphere at all. The fact that an occulting star vanishes behind the lunar disk instantly is accepted as a proof for the non-existence of a gaseous envelope on the moon.

On the other hand there are phenomena which may indicate the presence of an atmosphere. Although we have never observed a formation of clouds on the moon, occasionally local disturbances of the surface are observed. They are interpreted as a change of transparency of the atmosphere. A remargable phenomenon was observed by a number of astronomers during occultation of Jupiter on August 7, 1889. At the egress of this planet a strip of shadow covered the disk extending one-fifth of its diameter. This did not change for about a minute. The satellites of Jupiter were observed with diminished intensity in the region of the shadow. One explanation of the shadow is that it was caused by a lunar atmosphere.

An attempt to determine the density of a lunar atmosphere was made recently by J. N. Lipskij at the Astronomical Institute of Moscow. (*Trudy*, vol. 22, p. 66, 1953). It is obvious that any atmosphere will reveal itself by scattering the light of sun. This scattered light will be polarized. A maximum of polarization is obtained near the first or last quarter of the moon. From the observed polarization, however, that caused by the scattering in our atmosphere has to be subtracted.

From theoretical considerations it is possible to find a relation between the number of molecules above a unit of lunar surface and the amount of light scattered by the atmosphere. This last was determined from observations. Photographic and visual observations by means of a polaroid filter by the author have shown that the mass of the lunar atmosphere is at least 1/2000 of the terrestrial, provided they have the same chemical composition. The pressure of this supposed atmosphere corresponds to a pressure of 0.06 mm. of mercury, which on the earth is found at a height of about 45 miles.

—G.A.B., *Journal of the Royal Astronomical Society of Canada.*

SOME SUMMER STAR COLORS

by Campell McArthur

The striking colors of the bright stars have given pleasure to most of us but on a clear night the intensely colored fainter stars can be far more satisfying. The fainter red stars, Gamma Aquilae, Gamma Draconis, and Iota and Mu Cephei, are especially striking on a fine night. The summer replaces its loss of golden Capella with the light of Arcturus at the zenith, and Alpha Cassiopiae. The rarer colors, the lilac and lemon, the topaz and emerald, of the telescopist do not appear in the field glass, but there is still the yellow-green of Beta Librae. Those who live in northern United States must catch this star on an execeptional night. Once caught, its light is unforgettable.

Some people see no color in the sky; others see colors everywhere. Those who do have a good eye for the tints of faint stars can feel the proprietary thrill of finding a new and charming star friend by exploring for colors with a sharp-focusing field glass on the better nights this summer.

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THE PERSEIDS

Let us call your attention to the wonderful Perseid meteor shower, which achieves a maximum on the nights of the 11th and 12th of August. This, the most brilliant, spectacular, and consistent of all meteor showers, will be somewhat subdued this year in the presence of the nearly full Moon. However, it will still be well worth watching. Look toward the radiant point in the constellation Perseus. Frequency is much greater after midnight (standard time).

XUM

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current months—August - September, 1957—Anywhere in the world.

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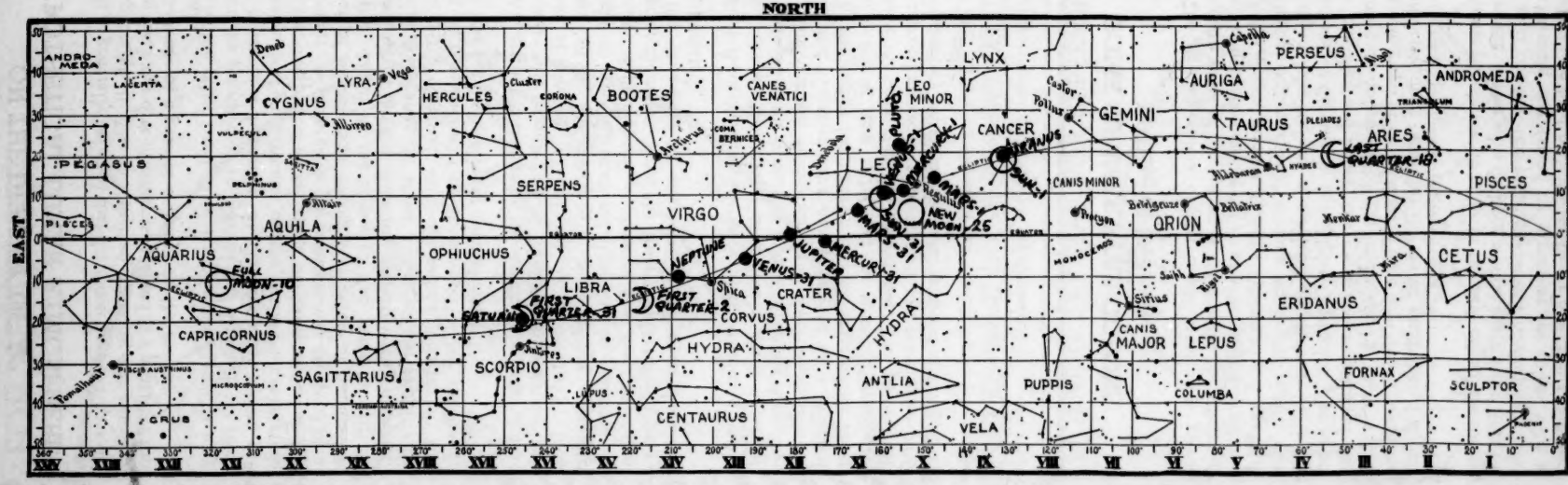

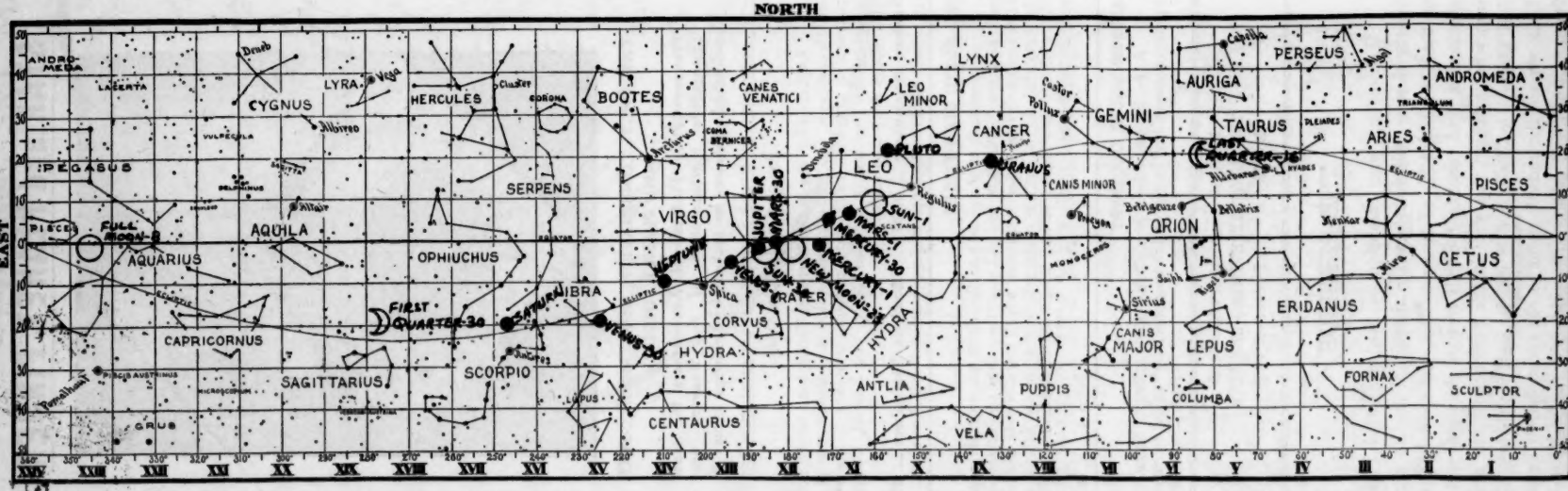

Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.